Xochimilco, containing excellent water, but their level is so low that it could only be made available for supplying the city of Mexico by enormous expenditure for pumping machinery. The basin of these lakes is bounded on the south and east by the mountains of the Ajusco and Sierra Nevada, and on the north by the Santa Catarina; a depression to the north-east connects it with the Vallée de Mexico, of which it forms a part. The lakes are fed by springs draining the underground waters from the volcanic formations of the Sierra Nevada and the Ajusco. The paper, which is an interesting study of the physical geography of the region, gives a preliminary account of attempts to tap these underground waters at a suitable level for gravitational supply to Mexico. The impermeable bed, believed to be andesitic, is being sought for below the basalt lavas and detritus by means of borings.

THE technique of basketry as manufactured by the Amerinds is the subject of a very valuable little paper by Dr. Otis T. Mason in the *American Anthropologist* (n.s., vol. iii. p. 109). Those who have desired to describe baskets and other objects plaited by primitive peoples have long wanted a system upon which to base their studies. This Dr. Mason has supplied, and all who study primitive industries once more have to thank their diligent and systematic American colleague.

THE *Kew Bulletin of Miscellaneous Information* (Appendix iii. 1901) contains the usual annual list of new garden plants recorded during last year in botanical and horticultural publications. The list includes, not only plants brought into cultivation for the first time during 1900, but the most noteworthy of those which have been re-introduced after being lost from cultivation.

A SECOND edition of "Marine Boiler Management and Construction," by Mr. C. E. Stromeyer, has been published by Messrs. Longmans, Green and Co. The book is described in the sub-title as "a treatise on boiler troubles and repairs, corrosion, fuels and heat, on the properties of iron and steel, on boiler mechanics, workshop practices and boiler design"; it was reviewed in these columns when the first edition appeared (vol. xlix. p. 410). About sixty pages of new matter have been added, including a chapter on steam, water and the boiling phenomena. No detailed accounts are given concerning water-tube boilers, because little exact information about the various types is available.

THE additions to the Zoological Society's Gardens during the past week include a Sooty Mangabey (*Cercocebus fuliginosus*) from West Africa, presented by Mr. E. Robinson; a Diana Monkey (*Cercopithecus diana*) from West Africa, presented by Mr. L. Gough; a Northern Mocking-bird (*Mimus polyglottis*) from North America, a Common Chameleon (*Chamaeleon vulgaris*) from North Africa, a Green Lizard (*Lacerta viridis*), European, presented by Miss Betty Cox; two Chaplain Crows (*Corvus capellanus*) from the Persian Gulf, presented by Mr. B. T. Ffinch; two Olive Weaver-birds (*Hyphantornis capensis*), two Alario Sparrows (*Passer alario*), eight Sulphury Seed-eaters (*Crithagra sulphurata*) from South Africa, presented by Mrs. R. Templeman; a Jackdaw (*Corvus monedula*), British, presented by Mr. L. Peevor; a Green Monkey (*Cercopithecus callitrichus*), a Jardine's Parrot (*Paeocephalus gulielmi*) from West Africa, a Pine Marten (*Mustela martes*), British; three King Snakes (*Coronella getula*), two Mexican Snakes (*Coluber melanoleucus*), a Chained Snake (*Coluber catenifer*), two Corn Snakes (*Coluber guttatus*), two Chicken Snakes (*Coluber obsoletus*), three Testaceous Snakes (*Zamenis flagelliformis*), a Long-nosed Snake (*Heterodon nasica*), an Amphiuma (*Amphiuma means*), three Menopomas (*Cryptobranchus alleghaniensis*), two Menobranchs (*Necturus maculatus*) from North America, deposited; two Barbary Wild Sheep (*Ovis tragelaphus*), a Japanese Deer (*Cervus sika*), a Yak (*Poephagus grunniens*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

WAVE-LENGTH OF GREEN CORONA LINE.—In the *Mem. della Soc. Degli. Spett. Ital.* (vol. xxx. pp. 124–128), Sig. Ascarza describes the results of observations made at Plascencia by the party from the Madrid Observatory during the total eclipse of the sun on May 27, 1900.

The instrumental equipment consisted of a Grubb coelostat with a mirror 20 centimetres diameter, furnishing light for a Steinheil objective of 12 centimetres aperture and 1·80 metres focus. This produced on the slit of the spectroscope an image of the sun about 16 millimetres in diameter.

A Dubosq spectroscope was used, furnished with six prisms and eyepiece micrometer reading to 1 : 300th of a millimetre. On account of the absorption of the prisms, only *three* were used for the final observations.

For the determination, measures were made on the lines 5328·696, 5270, 108 (E), and 5183·792 (b_1), and the resulting measures of the corona line reduced by interpolation formulæ. The spectroscope not being sufficiently powerful to separate the components of E, the mean of the wave-lengths of the two was adopted.

Preparation was made for both radial and tangential measures, but on account of the diffuse character of the line the tangential method was applied. The results were reduced by two interpolation formulæ, Gibbs and Hartmann, slightly varying values being obtained. The wave-lengths found on Rowland's scale were 5298·7 and 5298·818 respectively. The paper concludes with a note stating the difference of 4 tenth-metres between this value and that of 5303 obtained by Lockyer and Campbell from photographs taken during the total solar eclipse in India on January 22, 1898.

DEFORMATION OF THE SUN'S DISC.—In the *Mem. della Soc. Degli. Spett. Ital.* (vol. xxx. pp. 96–110), Sig. A. Ricco describes a long series of observations, both visual and photographic, of the varying deformations of the disc of the sun by the effect of atmospheric refraction, made at the observatories of Palermo and Catania (Etna). Many of the visual observations were made with a small Ramsden telescope having a terrestrial eyepiece, magnifying five times; photographs were also taken with a Merz telescope of 0·115 metre aperture and 1·93 metres focal length, adjusted to the chemical focus, giving an image about 0·0175 metre diameter.

The paper is illustrated by drawings and reproductions from many of the photographs, which are similar in many respects to those obtained by Colton at the Lick Observatory and published about 1895.

THE MINOR PLANET TERCIDINA.—In the note on p. 265, Prof. Hartmann's observations were misinterpreted. The photographs obtained at the Potsdam Observatory do not confirm the suspected variability suggested by the photograph obtained by Prof. Wolf in November 1899, nor do the later photographs of Prof. Wolf. The apparent variation may possibly be due to instrumental irregularities.

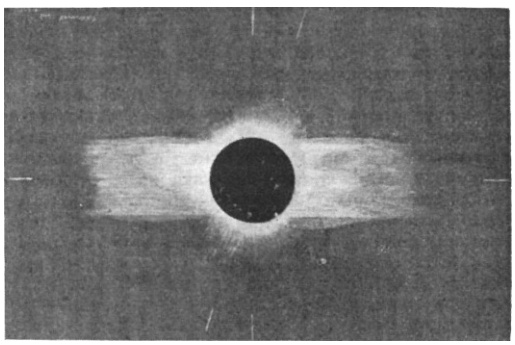
THE TOTAL ECLIPSE OF MAY 18, 1901.

THE following account of the total eclipse of the sun, May 18, is taken from a letter received from Mr. J. Cresswell, who was formerly a student of astronomical physics at the Royal College of Science, and is now engaged at a mining camp near the centre of Borneo (lat. 0° 45′ S., long. 113° E.).

The eclipse commenced about 12.20 in a cloudy sky, but fortunately about 15 minutes before totality the whole sky cleared and revealed a crescent sun. There were only one or two small clouds near the horizon, and the landscape appeared to have a peculiar violet tinge. There was no fall in temperature up to this point, the thermometer having remained stationary at 34°·75 C. Four minutes afterwards the landscape appeared as if seen through smoked glass, the temperature now being 34°·5. After the lapse of another 8 minutes the light was like that when a heavy storm is gathering, and shadows had a peculiar transparency; a number of stars appeared in the heavens distant from the sun. After 2½ minutes more had elapsed, second contact occurred and we were in darkness. The accompanying sketch of the corona was made and a photograph was taken with a small camera. The darkness was such that a small

paraffin candle burning 100 metres away appeared quite bright. After about a minute the bright prominence *a* was seen, and it seemed to penetrate slightly into the dark body of the moon; this was seen for quite two minutes. Just before third contact the blood-red chromosphere appeared. At this time the temperature had steadily fallen to 31° C., but the lowest temperature recorded was 30°·25, at 2h. 6m. 30s., making a total fall in temperature of 4°·5 C.

Through a ruby glass the corona was invisible, except an irregular rim about one-eighth of the sun's diameter in width.



No air movements were noticed during the eclipse. Birds were not noticed to go to roost, but it was stated that some fowls did so. There is an insect known to the Dyaks as the "six o'clock insect," which invariably gives utterance to a very loud horn-like cry just before dark (*i.e.* about 6 p.m.), but its call was not heard during the eclipse.

THE AIMS OF THE NATIONAL PHYSICAL LABORATORY.[1]

THE idea of a physical laboratory in which problems bearing at once on science and on industry might be solved is comparatively new. The Physikalisch-Technische Reichsanstalt, founded in Berlin by the joint labours of Werner von Siemens and von Helmholtz during the years 1883–87, was perhaps the first. It is less than ten years since Dr. Lodge, in his address to Section A of the British Association, outlined the scheme of work for such an institution here in England. Nothing came of this; a committee met and discussed plans, but it was felt to be hopeless to approach the Government, and without Government aid there were no funds.

Four years later, however, the late Sir Douglas Galton took the matter up. In his address to the British Association in 1895, and again in a paper read before Section A, he called attention to the work done for Germany by the Reichsanstalt and to the crying need for a similar institution in England.

The result of this presidential pronouncement was the formation of a committee which reported at Liverpool, giving a rough outline of a possible scheme of organisation. A petition to Lord Salisbury followed, and as a consequence a Treasury committee, with Lord Rayleigh in the chair, was appointed to consider the desirability of establishing a National Physical Laboratory. The committee examined more than thirty witnesses and then reported unanimously "that a public institution should be founded for standardising and verifying instruments for testing materials and for the determination of physical constants."

It is natural to turn to the words of those who were instrumental in securing the appointment of this committee, and to the evidence it received, in any endeavour to discuss its aim. As was fitting, Sir Douglas Galton was the first witness to be called. It is a source of sorrow to his many friends that he has not lived to see the Laboratory completed.

And here may I refer to another serious loss which, in the last few days, the Laboratory has sustained. Sir Courtenay Boyle was a member of Lord Rayleigh's committee, and as such was convinced of the need for the Laboratory and of the importance of the work it could do. He took an active part in its organisation, sparing neither time nor trouble; he intended that it should be a great institution, and he had the will and the power to help. The country is the poorer by his sudden death.

Let me now quote some of Sir Douglas Galton's evidence. "Formerly our progress in machinery," he says, "was due to accuracy of measurement, and that was a class of work which could be done, as Whitworth showed, by an educated eye and educated touch. But as we advance in the applications of science to industry we require accuracy to be carried into matters which cannot be so measured. . . . In the more delicate researches which the physical, chemical and electrical student undertakes, he requires a ready means of access to standards to enable him to compare his own work with that of others." Or again, "My view is that if Great Britain is to retain its industrial supremacy we must have accurate standards available to our research students and to our manufacturers. I am certain that if you had them our manufacturers would gradually become very much more qualified for advancing our manufacturing industry than they are now. But it is also certain that you cannot separate some research from a standardising department." Then, after a description of the Reichsanstalt, he continues, "What I would advocate would be an extension of Kew in the direction of the second division of the Reichsanstalt, with such auxiliary research in the establishment itself as may be found necessary." The second division is the one which takes charge of technical and industrial questions. Prof. Lodge, again, gave a very valuable summary of work which ought to be done.

It is now realised, at any rate by the more enlightened of our leaders of industry, that science can help them. This fact, however, has been grasped by too few in England; our rivals in Germany and America know it well, and the first aim of the Laboratory is to bring its truth home to all, to assist in promoting a union which is certainly necessary if England is to retain her supremacy in trade and in manufacture, to make the forces of science available for the nation, to break down by every possible means the barrier between theory and practice, and to point out plainly the plan which must be followed unless we are prepared to see our rivals take our place.

"Germany," an American writer who has recently made a study of the subject has said, "is rapidly moving towards industrial supremacy in Europe. One of the most potent factors in this notable advance is the perfected alliance between science and commerce existing in Germany. Science has come to be regarded there as a commercial factor. If England is losing her supremacy in manufactures and in commerce, as many claim, it is because of English conservatism and the failure to utilise to the fullest extent the lessons taught by science, while Germany, once the country of dreamers and theorists, has now become intensely practical. Science there no longer seeks court and cloister, but is in open alliance with commerce and industry." It is our aim to promote this alliance in England, and for this purpose the National Physical Laboratory has been founded.

It is hardly necessary to quote chapter and verse for the assertion that the close connection between science and industry has had a predominant effect on German trade. If authority is wanted, I would refer to the history of the anilin dye manufacture, or, to take a more recent case, to the artificial indigo industry, in which the success of the Badische Company has recently been so marked. The factory at Ludwigshaven started thirty-five years ago with 30 men; it now employs more than 6000 and has on its staff 148 trained scientific chemists. And now, when it is perhaps too late, the Indian planters are calling in scientific aid and the Indian Government are giving some 3500*l.* a year to investigation.

As Prof. Armstrong, in a recent letter to the *Times*, says, "The truly serious side of the matter, however, is not the prospective loss of the entire indigo industry so much as the fact that an achievement such as that of the Badische Company seems past praying for here." Another instance is to be found in the German exhibit of scientific instruments at the Paris Exhibition, of which a full account appeared in the pages of NATURE.

And now, having stated in general terms the aims of the Laboratory and given some account of the progress in Germany, let me pass to some description of the means which have been placed at our disposal to realise those aims. I then wish, if time permits, to discuss in fuller detail some of the work which it is hoped we may take up immediately.

The Laboratory is to be at Bushy House, Teddington. I will

[1] A discourse delivered at the Royal Institution on Friday, May 24, by Dr. R. T. Glazebrook, F.R.S., Director of the Laboratory.